~~CONFIDENTIAL~~/NOFORN/NOCONTRACT/ORCON

Bureau of Intelligence and Research

Current Analysis Series

January 14, 1983

SCIENCE & TECHNOLOGY
BI-WEEKLY REVIEW

Note. This is the first of a new INR series on non-military science and technology subjects. The focus will be on national security, trade, and research and development issues significant to US interests.

Japan's Progress in Computers and Electronics in 1982. Japan's prowess in the computer and electronic data processing (EDP) equipment fields grew significantly in 1982, with total revenues in these areas projected to be in excess of $35 billion. Actual total revenue for the first half of the Japanese Fiscal Year 1982 was over $17 billion. In the first half of the year, for example, Fujitsu Corporation's computer exports were approximately double that for the corresponding period in 1981.

All Japanese computer manufacturers had predicted an increase of at least 20 percent over 1981 in EDP revenues. Personal computer revenues alone were estimated to be some 81 billion yen (close to $400 million) for 1982. Significant increases were also derived from exports of peripheral equipment and large systems -- primarily to the US, but with sizable sales to the FRG as well.

It is likely that the Japanese pace of progress in computers and EDP equipment will continue to accelerate in 1983. Fujitsu, for example, will probably outpace US firms (again) by getting a 16,000 bit random access memory (RAM) semiconductor chip on the market in limited production quantities by the second quarter of 1983, with full scale production in 1984. This chip will replace one having only a quarter of the memory capacity that came out in 1980. It is probable that the chip will fit into previously sold equipment which will boost initial sales significantly.

The Japanese continue to surge ahead in still more advanced areas of the electronics field involved with semiconductor and integrated circuit (IC) manufacturing. The development of a reactive ion etching technology which is the key to the mass production of one megabit (one million bit) integrated circuit chips has been particularly notable. This is a technology receiving scant attention from US manufacturers, and the Japanese have at least a two year lead on the US. Reportedly, the reactive ion etching process will be offered for licensing in the US in 1983. However, no US firms have comparable production level technologies at present. Thus,

US IC manufacturing firms may be extremely dependent on the Japanese in this field, allowing Japan to develop a strong foothold in the US market.

There are some weaknesses in Japan's electronic production systems -- at least for the moment. For one, they have problems manufacturing high volumes of large computer systems because they lack sufficient data processing power to support design integration and quality control. As a result, firms like Hitachi and Fujitsu may purchase IBM computers for use in producing their own computers.

Another problem is a growing shortage of trained manpower. The Japanese tend to rely heavily on engineers to complete design patterns manually. They also use technicians frequently for visual quality control inspections. And the use of robotics -- often 30 percent or more than in the US -- is not easing the problem significantly. Thus, as labor costs rise and manpower pools shrink, it is highly likely that pressures will increase strongly to acquire skills and equipment in the CAD/CAM (computer-assisted design/computer-assisted manufacturing) area. (CONFIDENTIAL/NOFORN/NOCONTRACT/ORCON)

Drafted by: INR/GIS:FFMonroe
x25956

Approved by: INR/AR:CTThorne
x21038